

Project Goal: Evaluate herbicide programs to provide recommendations for XtendFlex soybean weed management in counties under restrictions from the endangered species act (ESA).

Site Description:

Location: Brooklyn, WI	Crop: XtendFlex soybean
Field #: OB-1	Variety: AG20XF1
Soil type: Kegonsa silt loam	Planting Date: 5/25
% OM: 2	Emergence Date: 6/2
pH: 7.1	Population: 140,000 seeds/acre
Fertilization: -	Depth: 1.25 in
Previous crop: Seed Corn	Row spacing: 30 in
Tillage: conventional	Plot Size: 10 x 30 ft
Weed species: glyphosate resistant waterhemp (AMATA); velvetleaf (ABUTH); common lambsquarters; (CHEAL)	

Herbicide Application Information:

Date:	5/26	6/22
Treatment:	PRE (A)	POST (B)
Air Temp (°F):	73	65
2" Soil Temp (°F):	69	51
Soil moisture [surface]:	dry	damp
RH %:	58	51
Cloud cover %	55	10
Wind speed (mph)/direction	6-12/NW	3-10/W
Rainfall (in) 1 wk after APP:	0.61"	3.21"
GPA:	15	15
PSI:	34	34
Nozzle:	TTI 110015	TT 110015
Nozzle spacing (in):	20	20
Boom Height (in):	20	24

Crop and weed information at application:

	Date:	5/26	6/22
Soybean	Height:	-	-
	Stage:	-	V3
waterhemp	Height:	-	1-4"
	Density:	-	0-8/m ²
velvetleaf	Height:	-	1-4"
	Density:	-	0-4/m ²
lambsquarters	Height:	-	0.5-4"
	Density:	-	0-4/m ²

*Weed density recorded from plots with a previous herbicide treatment.
Density and height varied depending on the effectiveness of the PRE herbicide.

Trt #	Treatment	Formulation	SOA Group	Rate	App Timing	App Code
1	Check					
2	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
3	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
4	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
5	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
6	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
7	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
8	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
9	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B

Adjuvants: AMS = Amsol (liquid AMS); VaporGrip Xtra = volatility reducing agent (VRA)

***MON301668** is an experimental formulation of encapsulated acetochlor similar to Warrant herbicide with a higher active ingredient load per gallon of formulated product.

Trial Summary:

This trial evaluated multiple 2-pass herbicide programs to provide recommendations for weed management in XtendFlex soybeans in counties under restrictions from the endangered species act (ESA). Currently 26 Wisconsin counties are listed as counties under the ESA. Since, over the top applications of XtendiMax have further in field buffer requirements these programs were designed to avoid POST applications of XtendiMax all together. There was no observable soybean injury from the PRE herbicides (data not shown). There was soybean injury 8 and 16 days after the POST application (Table 22). Injury symptoms included leaf necrosis (burn) and leaf crinkling. Tank mixes with Warrant Ultra had the greatest % injury (~22%) while tank mixes with Liberty + MON 301668 had ~12% injury.

The trial was conducted in a field with a population of glyphosate-resistant waterhemp. All treatments provided excellent season long waterhemp control (Table 22). Waterhemp control from the PRE herbicides at the time of POST application was good to excellent ~88-97%. The addition of XtendiMax to the tank at the PRE application resulted in better control of waterhemp and other broadleaf species (velvetleaf, common lambsquarters) in the trial area. Averaged across all PRE treatments, broadleaf residual control of Fierce EZ + XtendiMax was 95% vs 83% of Fierce EZ alone. All POST herbicide programs provided excellent waterhemp control.

Yield differed among herbicide programs (Table 22). Treatments with applications of Warrant Ultra + Liberty POST had slightly lower yields when compared to other POST tank mixes.

Plot photos from throughout the growing season are available at [XtendFlex Soybean Herbicide Recommendations for ESA Counties](#) published on wiscweeds.info.

Table 22. Soybean injury, weed control ratings, and soybean yield for trial #21-BRO-SB13 at Brooklyn, WI.^a

Trt #	Herbicide (rate acre ⁻¹)	Injury ^c (%)		Waterhemp (%)				Overall ^d (%)				Yield ^b bu acre ⁻¹
		6/30	7/7	6/16	6/22	7/7	9/21	6/16	6/22	7/7	9/21	
1	Untreated Check	0	0	0	0	0	0	0	0	0	0	50 d
Two-Pass – PRE (5/26) fb POST (6/22)												
2	Fierce EZ (6 fl oz) fb Liberty (32 fl oz) + MON 301668 (30 fl oz) + AMS**	12.5	10.0	95	91	100	99	90	85	98	99	66 abc
3	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Liberty (32 fl oz) + MON 301668 (30 fl oz) + AMS**	12.5	10.5	98	96	100	100	97	95	100	100	66 abc
4	Fierce EZ (6 fl oz) fb Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + MON 301668 (30 fl oz) + AMS**	12.0	9.3	96	92	100	99	88	81	99	99	68 ab
5	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + MON 301668 (30 fl oz) + AMS**	12.0	10.8	98	96	100	100	97	96	100	100	69 a
6	Fierce EZ (6 fl oz) fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + AMS**	21.8	16.3	94	90	99	100	87	83	98	99	63 c
7	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + AMS**	21.3	15.0	100	97	100	100	98	96	100	100	63 c
8	Fierce EZ (6 fl oz) fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + AMS**	23.3	16.5	94	88	100	100	90	85	97	98	66 abc
9	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + AMS**	23.5	16.3	99	97	100	100	96	95	100	100	64 bc
LSD ($\alpha=0.10$)		3.0	1.9	3	4	ns	0.5	3	4	ns	ns	4
p value		<.001	<.001	0.006	0.002	0.168	0.080	<.001	<.001	0.398	0.704	<.001

^aVisual control from 70-100% is illustrated on a color scale with green representing greater weed control values.

^bYield values with the same letter are not significantly different.

^cCrop injury symptoms included leaf necrosis (burn) and leaf crinkling.

^dOverall weed control included all species in the trial area: waterhemp, velvetleaf, and common lambsquarters.

*All PRE applications of XtendiMax included 20 fl oz/a VaporGrip Xtra, a volatility reducing agent.

**Liquid AMS was applied at 2.5% v/v